

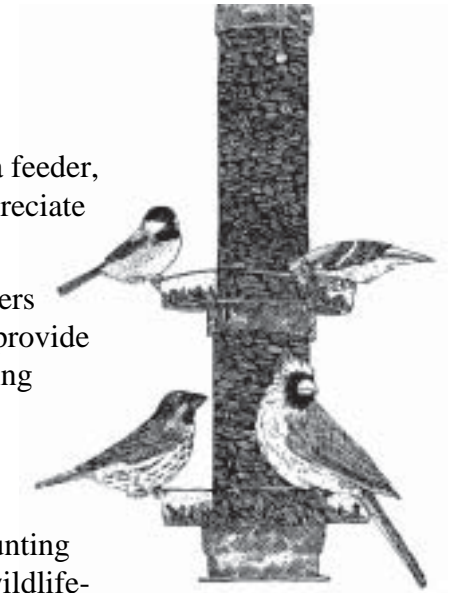
UNIT 3

Wildlife Management

Iowa's wildlife is a valuable resource. People who view birds at a feeder, drive to a park to catch a glimpse of a deer, or plan a hunting trip appreciate wildlife. Iowans benefit from wildlife in many ways.

Wildlife-related license fees and travel expenditures paid by hunters not only boost the economy, but pay for conservation programs that provide wildlife restoration and protection for all wildlife in Iowa. Deer hunting contributes more than \$80 million to Iowa's economy each year.

Many businesses (sporting goods, ammunition, and birdseed manufacturers, as well as lodge, motel, restaurant, and convenience store owners) are dependent on people viewing, photographing, or hunting wildlife. Wildlife enriches our lives. Opportunities to participate in wildlife-related recreational activities improve the quality of life in Iowa.



What is Wildlife Management?

People can assist wildlife by creating habitat that better meets certain species' needs. Habitat also can be restored (e.g., planting native trees in a harvested forest). Anything done to help wildlife can be called **wildlife management**, but a formal definition is the application of scientific knowledge and technical skills to protect, conserve, limit, enhance, or create wildlife habitat. Wildlife management also includes implementing laws regulating the use, kinds, and amounts of wildlife people can harvest. Laws that protect existing habitat are also wildlife management tools.

Wildlife biologists (professional managers) use carefully collected information to manage wildlife populations to achieve a variety of recreational and aesthetic benefits for people while ensuring the future of wildlife.

History of Wildlife Management

Prior to 1900, few laws or regulations were imposed on hunting wild animals in this country. Even species now considered **nongame** (non-hunted) were harvested during all seasons of the year. **Market hunters** harvested hundreds of thousands of animals to sell to a growing nation. They killed animals and marketed the meat for food, hides for clothing or trading, and feathers for decoration.

Laws were passed to protect wildlife from market hunting, but this was not the only problem. Settlers changed the habitat available to wildlife species. They plowed prairies, drained wetlands, and built towns. These activities, and unregulated hunting, caused drastic declines for many wildlife species. **Predators**, animals that hunt and kill other animals for food, (e.g., weasels, coyotes, foxes, wolves) were shot on sight and considered vermin because they were perceived as a threat to domestic sheep, chickens, or cattle as well as game animals.

Iowa's "big game" or large animal species (e.g., bison, elk, white-tailed deer) had virtually disappeared by the late 1800s. Some people were concerned by these extirpations. Laws were enacted to "protect" **game** (hunted) animals by limiting hunting and removing predators. State game wardens were hired in the early 1900s to enforce these laws. Most of the funding for early wildlife management efforts came from the sale of hunting and fishing licenses and federal excise taxes on hunting and fishing equipment.

Many game populations continued to suffer, so managers tried to supplement them with animals raised in captivity, but this didn't work either. Biologists conducted research to better understand species' needs and realized habitat was a critical factor for wildlife survival, so efforts increased to obtain and enhance habitat. Extirpated species were reintroduced.

Habitat for game species benefited many nongame (non-hunted) animals, but specific funding for management of nongame species was not provided until 1981 when the "Chickadee Checkoff" was placed on Iowa tax forms. Donations from this tax check-off were used to fund the Nongame Program (now Wildlife Diversity), which is responsible for all nongame animals. National initiatives including "Teaming With Wildlife" and the "Conservation and Reinvestment Act" to provide long-term, stable funding for management of all wildlife species have not come to fruition.

<i>Iowa Wildlife Management Timeline</i>	
1891	State Fish & Game Commission established
1935	State Fish & Game Commission merged with the State Board on Conservation to form the Iowa Conservation Commission
1986	Conservation Commission became part of IDNR

Biologists now try to manage from a "landscape" perspective. This takes into consideration all plants and animals in an area, in contrast to management for a single species. Key indicator species are monitored, but the goal is to enhance the whole biological system. For example, landscape management strives to conserve an entire prairie system, complete with prairie chickens, skipper butterflies, pale purple coneflowers, and prairie rattlesnakes.

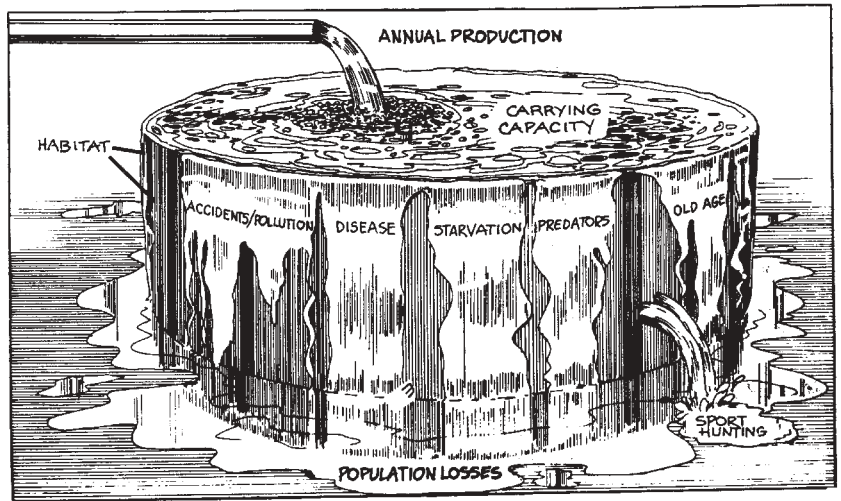
Population Limits

Habitat and Carrying Capacity

The abundance of all wildlife is directly related to the *amount*, *quality*, and *availability* of wildlife habitat. As a wildlife population increases, it uses more resources. No limited-size area of land can provide an inexhaustible supply of habitat for an ever-increasing number of animals. One area can support only a limited number of animals using similar resources.

This limit is called **carrying capacity**. If the number of animals in a habitat exceeds the carrying capacity, they degrade the habitat by eating available food and eliminating cover, reducing the carrying capacity for that species. Increased disease, lower reproduction, and/or starvation decrease the number of animals. The population fluxes around the carrying capacity.

A gallon bucket provides an example of carrying capacity. The bucket holds one gallon of water. If more water is added, the extra leaks down the sides. The same is true of habitat. Each habitat supports a certain amount of wildlife. There is only so much food, water, shelter, and space available. If more animals are added, they will not find enough food, water, shelter, or space. The surplus animals must either move to new habitat or they will die from predation, disease, or starvation. Carrying capacity of a habitat may change from season to season. Typically, it's highest in the growing season when resources are plentiful and lowest in winter when resources are most restricted.

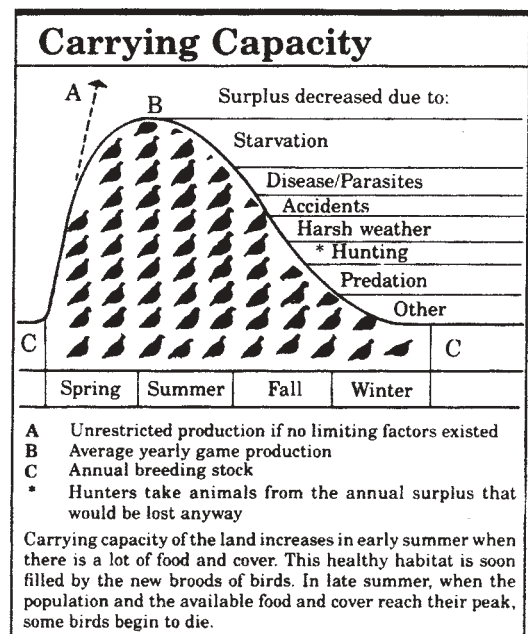


Many factors may affect the carrying capacity of any habitat. Shortage of any of the basic needs (food, water, shelter, and space) is a **limiting factor**. Limiting factors are usually habitat-related, based on the quality and quantity of available resources. Human influences, such as destruction of habitat or disturbance of nesting or brooding sites, also may limit carrying capacity of an area for certain animals.

Mortality Factors

Many factors contribute to the death of wild animals and reduce wildlife populations. Mortality factors (causes of death) are related to climate, diseases, parasites, starvation, weather, predation, and hunting. They usually affect the overflow, or **surplus**, animals. It is normal for a certain number of animals to die each year. If the habitat remains healthy, wildlife will make up for the loss of individual animals by producing more young. Mortality factors help balance wildlife populations with their habitat.

Hunting is an important wildlife management tool for some wildlife populations. One example is white-tailed deer. Without wolves and other large predators, deer numbers can increase above their habitat's carrying capacity. IDNR manages deer populations by regulated harvest by hunters. Deer licenses are issued for certain numbers and sexes in different zones of the state. Most hunted wildlife species are examples of good conservation. Hunters take annual surplus animals that would otherwise die from natural causes, avoiding over population problems.



Forms of Wildlife Management

Wildlife management techniques are used to increase, maintain, or reduce wildlife populations.

Habitat Restoration and Management

Habitat restoration/management is a primary tool wildlife biologists use to manage, protect, and enhance wildlife populations.

Increased wildlife diversity in an area may be a wildlife management goal. It is difficult to develop strategies for managing each species separately because there are hundreds of species of birds, mammals, fish, amphibians, reptiles, and invertebrates, each with different needs. Several wildlife species can benefit when a complete habitat type or ecosystem is improved, created, or preserved intact. Managers often restore/manage habitats to meet the needs of threatened or endangered species, or groups of species (e.g., grassland birds).

Restoring wetland areas has many benefits. Wetlands cleanse water and improve water quality as it flows through to nearby streams and rivers, improving these habitats for fish and other aquatic species. They provide nesting and escape cover for waterfowl and other game birds and mammals. They also supply food, shelter, and denning and nesting sites for dozens of species ranging from snails, dragonflies, and turtles to rails, muskrats, and mink.

Managers may restore wetlands by removing or plugging tile lines, or create new ones. Often, wetland plants return once the basin fills, but a new wetland may also be seeded. Managers may manipulate water levels to increase the plant growth for food and cover. They also plant surrounding areas to native grasses to provide nesting sites for some wetland birds and to protect water quality. Since 1990, over 7,600 acres of wetlands have been restored. Approximately 650 acres are restored each year.

Wildlife managers also restore prairies. This may include making sure an area is large enough to support area sensitive species such as prairie chickens and northern harriers. Many of Iowa's endangered plants and wildlife species are prairie-dependent. Prairies also benefit other native plants and animals.

Roots of prairie plants reach several feet into the soil, holding it in place and increasing its ability to absorb water. This reduces erosion as well as the volume of water and contaminants entering streams, rivers, and lakes. Since 1997, almost 147,000 pounds of native prairie seeds have been harvested. Almost 11,700 acres of prairie have been restored.

Managers may enhance grassland areas by clearing brush (prescribed burning, cutting, herbicides) and removing trees, as well as over-planting them with native prairie species. This helps reduce cover used by edge predators (skunks, raccoons, red-tailed hawks) and improves the quality of the habitat for grassland animals.



food plot

Biologists plant food plots (corn, sunflowers, legumes) and grasslands to provide winter food and spring nesting and brood rearing cover for upland game birds (e.g., ring-necked pheasants). Success or failure of spring nesting and rearing of young often has the greatest impact on populations. Harsh winters (with long periods of snow cover and icy conditions) and very wet springs can reduce nest success and increase mortality of young.

Harvest

Management goals are dictated by the success or failure of rearing young. Changes in weather conditions over several years can have severe impacts on wildlife populations. Adjusting the harvest may be the best way to maintain certain game populations. For example, when major areas used by ducks for nesting experienced several years of drought, the number of ducks hunters could shoot was decreased until the wetlands refilled and duck numbers recovered.

Managers may strive to reduce or maintain populations so animals conflict less with human activities. For example, white-tailed deer are abundant in urban areas. This presents challenges for wildlife managers because hunting with firearms is not allowed. Trapping and relocating deer are expensive, time-consuming, and don't provide a long-term solution. Relocated deer do not survive well in unfamiliar areas that probably are at carrying capacity for deer already. The most effective solution has been controlled hunts.

Another example is the trend in the buck:doe deer harvest ratio. The percentage of bucks harvested is increasing. This may create an imbalance and lead to an unhealthy deer population. Regulations that encourage harvest of more does in areas with many deer may result in more mature bucks and a healthier deer population.

Endangered Species Management

Endangered or threatened species require intensive management. Critical habitat and locations of existing populations must be identified so they can be managed successfully. Numbers of individuals and survival rates in existing populations are tracked. Specific habitat types may be created. Existing areas where endangered species are found are protected and/or managed.

An animal species is considered **endangered** when its numbers become so low that experts think it may become extinct unless action is taken to save it. In Iowa, 49 species of animals are endangered. Seven also are listed as federally endangered (least tern, piping plover, bald eagle, pallid sturgeon, Indiana bat, Higgin's-eye pearly mussel, and Iowa Pleistocene snail). This listing requires biologists to follow certain procedures for management actions.

Threatened species' populations are showing signs of unnatural decline or they are vulnerable to becoming endangered. Thirty-six animals are listed as threatened in Iowa.

A species can be listed as endangered or threatened at the state or federal level, depending on the extent of the area where the population is declining. Federally endangered species found within a state's borders are automatically placed on the state list. Endangered species lists constantly change. Look for a complete list of Iowa's endangered and threatened species on the IDNR web page (www.iowadnr.com/other/threatened.html).

Many endangered or threatened species are **specialists** (have very restrictive habitat needs, eat only a few foods, or require specific kinds or sizes of habitat). The leading cause for a species becoming endangered or threatened is habitat loss.

Species Reintroduction

Another wildlife management goal may be to re-establish species in suitable habitat. Eastern wild turkeys, white-tailed deer, peregrine falcons, barn owls, river otters, beaver, sharp-tailed grouse, giant Canada geese, greater prairie chickens, sandhill cranes, and trumpeter swans once were **extirpated** (entirely gone from Iowa) due to loss of habitat, unregulated hunting, and/or persistent pesticides in the environment. They are found in the state once again as a result of IDNR reintroduction programs and management efforts.



trumpeter swan

Native Species Reintroduction Success Stories

IDNR began reintroduction programs in the 1960s. These are directed through the Wildlife Bureau (including the Management, Research, and Wildlife Diversity sections). Most programs have been very successful. Biologists consider several factors before initiating a reintroduction effort: availability of appropriate habitat, concerns the public may have, availability of genetically suitable individuals of the species to be reintroduced, and much more, depending on the situation.

The following table summarizes information about several species reintroductions in Iowa.

Native Species Reintroductions

Species	Reason for extirpation	Reintroduction methods	Results
eastern wild turkey	disappearance of forest habitat & unregulated hunting—last nest found in 1910	unsuccessful attempts releasing pen-reared birds & wild birds from Rio Grande Valley; success with turkeys from MO trapped in habitats like those available in IA; rocket cannons allowed easy capture; extensive trap & release program throughout IA	successfully reestablished in all IA counties; found in suitable forest habitat in numbers that allow spring and fall hunting seasons
giant Canada geese	draining of wetland habitat & unregulated market hunting for down, meat, and eggs—last nest found in 1910; exploitation by early settlers	pairs purchased from game breeders released at Ingham Lake; flightless young captured & relocated to new release areas (refuges around flocks)	found throughout IA; limited by suitable wetland areas, farm ponds, lakes, & river backwaters; support a fall harvest; IA populations (including migratory birds) may rival those seen in 1800s
barn owl	conversion of pastureland to row crop reduced vole (small rodent) habitat & numbers;—voles comprise up to 90 % of diet	captive breeding program provided young birds for release; radio telemetry tracked birds; nest boxes placed in appropriate habitat	nests recorded each year; expanding to new areas in southern IA
ruffed grouse	prefer early successional stages of shrubby growth following tree cutting; conversion of shrubby areas to pasture & row crop caused disappearance from all but NE corner of IA by 1930s	wild-trapped birds relocated from NE IA created population in south central IA; turkeys & pheasants swapped with other states for wild-trapped ruffed grouse; ~1,300 grouse released in 14 counties, placing birds in major remaining blocks of timber habitat in IA	secretive & difficult to survey, but broods sighted at nearly all release sites; populations uncertain; long-term status dependent on forest management practices; selective timber harvests can increase populations
sharp-tailed grouse	loss of prairie & mixed brushy/grassland habitat; disappeared from the state by 1892	wild-trapped sharp-tails released in the Loess Hills; birds obtained by trades with other state conservation departments	too early in reintroduction process to determine results; more habitat work, releases, & time needed; population present but uncertain
greater prairie chicken	habitat changes—by settlers provided grain fields for food & pastures & hayfields for brood cover; remaining large tracts of prairie used for booming grounds & nesting; prairie disappeared as agriculture intensified	release of wild-trapped birds held in captivity for extended periods unsuccessful; birds trapped & released immediately into booming ground habitat in spring; wild birds obtained by trading and IDNR staff capturing birds from KS leks	leks established in 6 counties after several successive years of releases; population reestablished but limited; some chickens released in IA helped establish population in northern MO on historic site (a large, privately owned ranch); returned to Midwest through establishment of Bird Conservation Areas (BCA) & government programs that provide funding for habitat management on private lands
river otter	intense, unregulated harvest for fur; degradation of stream & river habitats	wild-trapped otters obtained in trades for turkeys to other states, who then purchased otters for IA from LA; private groups helped raise \$ to buy otters	sighted along major rivers & streams in 90 counties; reproduction documented in 75 counties

Species	Reason for extirpation	Reintroduction methods	Results
peregrine falcon	use of DDT (a pesticide that bio-magnifies in the food chain) caused reproductive failure—last nest in IA in 1960s	young, non-flighted falcons from captive breeding programs hacked (provided food while matured enough to fly & hunt on their own) at various locations across the state; efforts concentrated along the MS River (historic peregrine range) & areas with tall buildings (simulating original cliff nesting areas)	removed from federal endangered species list in 1998
trumpeter swans	unregulated hunting, egg collecting, & wetland destruction & drainage	swans obtained from zoos, private propagators, & swan projects in other states; flightless breeding pairs established on public & private land in suitable habitat; young allowed to fly free or held in potential release sites until mature	sightings no longer rare in IA; 9 nests recorded in 2001–6 produced young; may once again nest across IA if mortalities from accidental shootings and other trauma are minimized
osprey	never confirmed as historical nesters in IA, though probably here given abundant wetland habitat in NW IA; nationwide numbers declined due to DDT poisoning & egg shell thinning	young purchased from MN & WI; 1 nestling removed from wild nest for relocation, leaving siblings for parents to raise; young birds hacked in lake & river areas; 47 birds released at 3 sites	3 nests documented in IA in 2001

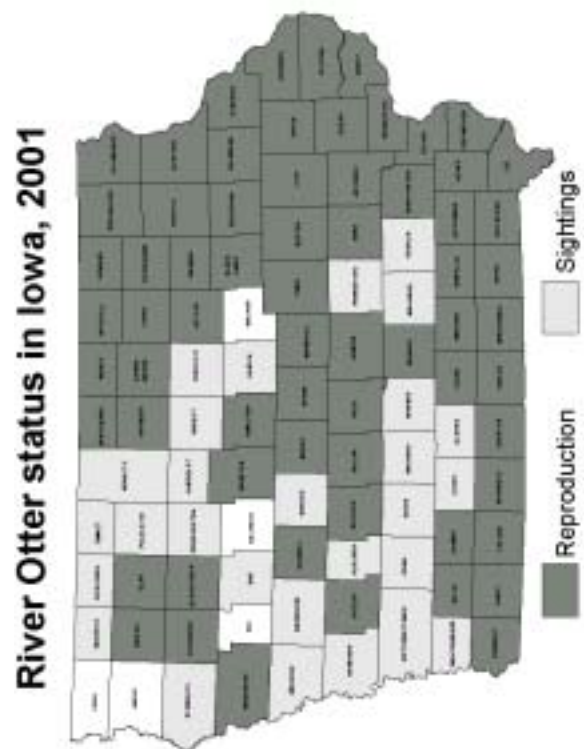


otter release



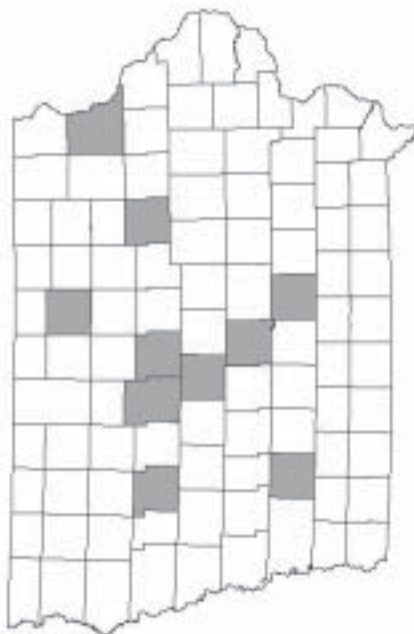
rocket cannons used to capture wild turkeys

Reintroduction Release Sites



Reintroduction Release Sites (continued)

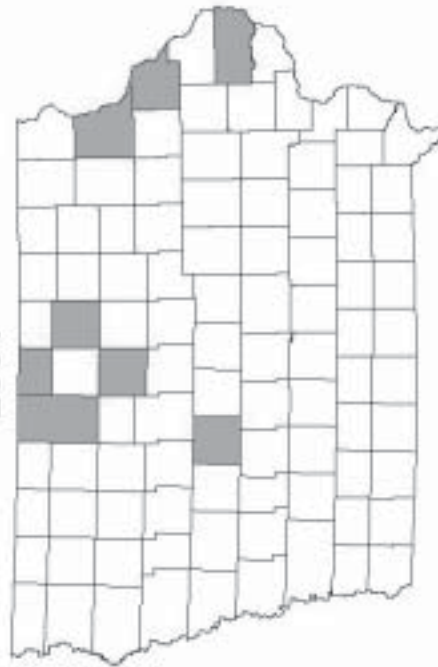
**Trumpeter Swan wintering sites,
2001**



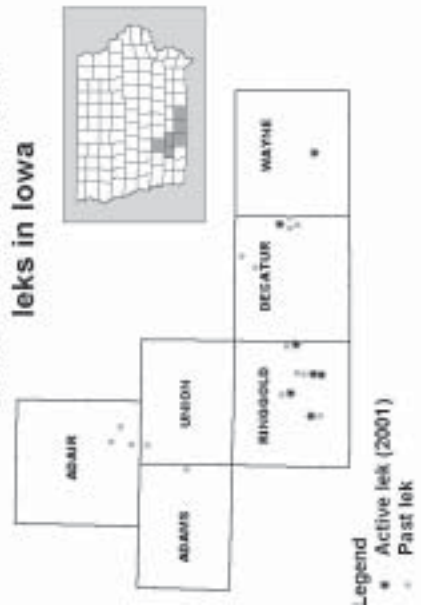
**Greater Prairie Chicken Release Sites
1980-2001**



**Trumpeter Swan nesting sites,
2001**



**Locations of past and active
Greater Prairie Chicken
leks in Iowa**





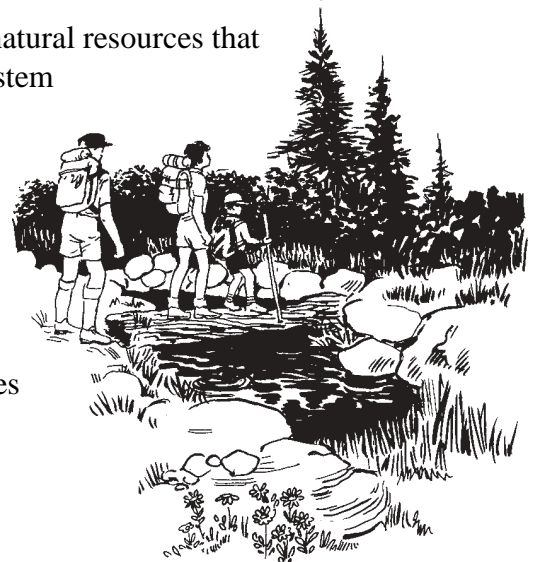
hack box

Conservation and Preservation

Wildlife **conservation** helps ensure future generations can enjoy our resources. Conservation can include **consumptive** (involve taking or harvesting natural resources) activities such as hunting, fishing, trapping, and harvesting timber as well as **non-consumptive** (do not involve taking or harvesting) activities such as bird watching, photography, and hiking. Both impact wildlife issues between populations.

Conservation must balance issues between wildlife and human populations. Conservation of wildlife implies insuring threatened and endangered species receive special management to protect their presence in the future.

Conservation may include **preservation** (protection of natural resources that emphasizes non-consumptive activities). A habitat or ecosystem can be preserved by manipulation (e.g., managing a prairie with fire to eliminate woody species and preserve prairie plants). An area also may be managed by doing nothing at all. For example, when a forest is allowed to mature without any human manipulation such as timber harvest, grazing, or tree planting. IDNR concentrates preservation efforts in areas where quality native habitat remains intact—creating state preserves, historical sites, or refuges for species with specialized habitat requirements.



Monitoring Wildlife Populations

IDNR is legally charged with responsibility for the protection, enhancement, management, and preservation of Iowa's wildlife resources. Wildlife biologists use many techniques to monitor wildlife and gather information that helps determine wildlife management policies and practices. Similar wildlife management systems and techniques are used across North America. Biologists attempt to standardize information-gathering techniques so data can be shared and compared with other agencies.

Biologists conduct surveys, inventory existing populations, evaluate habitat, and do research. These monitoring techniques provide information about distribution, abundance, or needs of wildlife species ranging from salamanders and frogs, to deer and pheasants, to songbirds and eagles. This information is used to make management decisions.

Biologists use some surveys to estimate the number of a particular wildlife species in a specific area at a given time. Others track general population trends that allow biologists to correlate wildlife abundance with weather, habitat influences, hunting pressure, and more over time. Small representative tracts of habitat are surveyed for the animal being studied. Biologists can estimate how many animals might be found in similar habitats using information from these sample areas. They can then estimate that species' total population for the region.

Biologists can determine birth and death rates by studying animals. This may involve systematically capturing animals, marking them, and releasing them for tracking. Information from a recaptured, marked animal can be compared to data collected at its initial capture. Biologists use this information to learn more about the animal's age, growth, health, and range of habitat use.

Deer Surveys

IDNR biologists do aerial surveys of deer populations in winter when trees are bare and snow cover makes deer more visible. Biologists survey 300 to 350 areas each winter to get an indication of the state's deer population.

A spotlight survey is conducted in April to supplement aerial survey data. Biologists drive selected routes at night and use a spotlight to detect animals by their eye shine.

Vehicle-deer collision reports also are used to create population models that can provide better population estimates and help set harvest strategies. Other important monitoring methods include collecting detailed harvest information and computer modeling techniques that can be used to determine population trends.



August Roadside Survey

Roadside surveys are used to monitor population trends of small game animals. Biologists and conservation officers drive over 200 routes (30 miles each) on mornings with heavy dew cover. They count the number of rooster and hen ring-necked pheasants, hens with broods or young, and the number of young. Additional wildlife (e.g., gray partridge, bobwhite quail, jackrabbits, cottontail rabbits) is noted also. Biologists have run these routes for years so they can compare year-to-year survey data. Counts provide an index to establish population trends and set hunting season limits.

Scientifically valid harvest information also is collected each year. Biologists use data layers from aerial photographs and GIS information to monitor habitat trends.

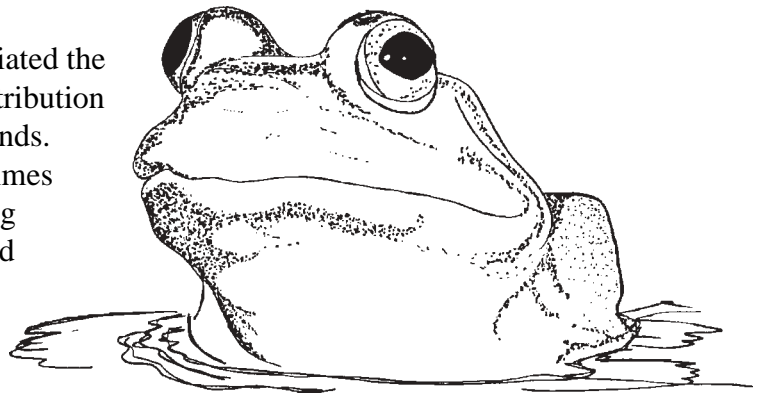
Postcard Surveys

Harvest surveys are used to determine the number and types of wildlife hunted and harvested each year. Postcards are sent to a (randomly chosen) representative sample of persons who purchased hunting licenses. Participants are asked if they hunted; how many days they hunted; where they hunted; the species and gender of animal they hunted; and if they were successful. Hunters who hunt white-tailed deer, turkeys, ring-necked pheasants, quail, rabbits, squirrels, partridge, and waterfowl are surveyed.

Responses can be indicators of population trends and distributions, so help managers set seasons and bag limits. Personal behavior may influence responses on these surveys. For example, hunters may take more bucks than does. This may not indicate a change in the sex ratio of the population, but simply that hunters prefer to harvest bucks.

Nongame Surveys

The IDNR Wildlife Diversity Program re-initiated the **Frog and Toad Survey** in 1991 to determine distribution of Iowa's breeding frogs and toads population trends. Volunteers survey the same wetland areas three times during the spring and summer. They listen for frog and toad calls, record which species they hear, and estimate abundance of each. The absence or loss of certain kinds of frogs or toads could indicate deteriorating water quality or other changes in a survey area.



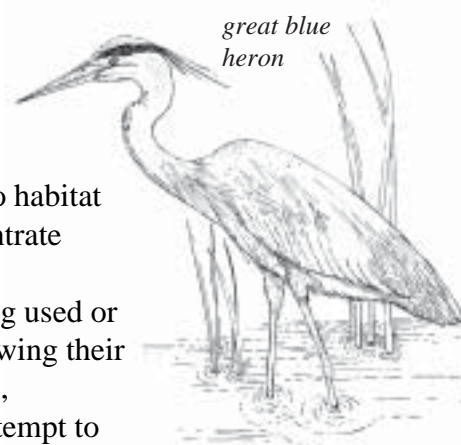
The **Breeding Bird Atlas** is used to determine distributions of Iowa's breeding birds. Set blocks of habitat throughout the state are searched during the nesting season. Information gathered is used to help managers develop plans to reach statewide goals for bird populations. The Wildlife Diversity Program coordinated the *Breeding Bird Atlas* in the late 1980s with assistance from many groups including the Iowa Ornithologists Union (IOU) and local Audubon Society volunteers. The next *Breeding Bird Atlas* in Iowa should be done around 2015.

The **Winter Bird Feeder Survey** and **Christmas Bird Count** provide information about long-term population trends of Iowa's winter birds, the distribution of species, and occurrences of uncommon winter species. Birders tally different species and numbers of birds that visit their feeders during a few select days in January for the **Winter Bird Feeder** survey sponsored by IOU. **Christmas Bird Counts** sponsored by Audubon Society chapters survey birds within a seven-mile radius of selected sites. **Bald Eagle Surveys** monitor the status of wintering bald eagles and note critical roosting areas. One of the major winter concentrations of eagles in the nation is the Upper Mississippi River, but more eagles are seen in other parts of Iowa each year. Biologists also monitor bald eagle nests and their success.

A **Raptor Nesting Survey** utilizes volunteers to monitor raptor nests throughout the spring and summer. It provides vital information about birds of prey nesting in Iowa, including five species on the state's endangered or threatened lists.

Peregrine Falcon Surveys are conducted at potential nesting sites. Volunteers monitor selected areas for falcon activity and watch known nest sites and record falcon behavior. This information may show increases in the number of nesting peregrines in the state and help provide the documentation needed to remove them from the state's endangered species list.

Colonial waterbirds (nest in colonies called **rookeries**) include double-crested cormorants, yellow-crowned night-herons, black-crowned night-herons, green herons, little blue herons, cattle egrets, great blue herons, and great egrets. These species are vulnerable to habitat destruction and human disturbance because they concentrate their nests at relatively few sites. IDNR biologists and volunteers try to locate and keep track of rookeries being used or constructed with the **Colonial Waterbird Survey**. Knowing their locations may help protect them from timber operations, development, and other disturbances. Biologists also attempt to educate landowners about good management practices to protect these species.



The Wildlife Diversity Program monitors the number and species of bats using bat boxes with the **Bat Box Survey**. Volunteers can erect boxes and help with this count. Information is sent to Bat Conservation International, a private conservation organization, to assist with a national survey of bat populations and to help biologists learn more about bat biology.

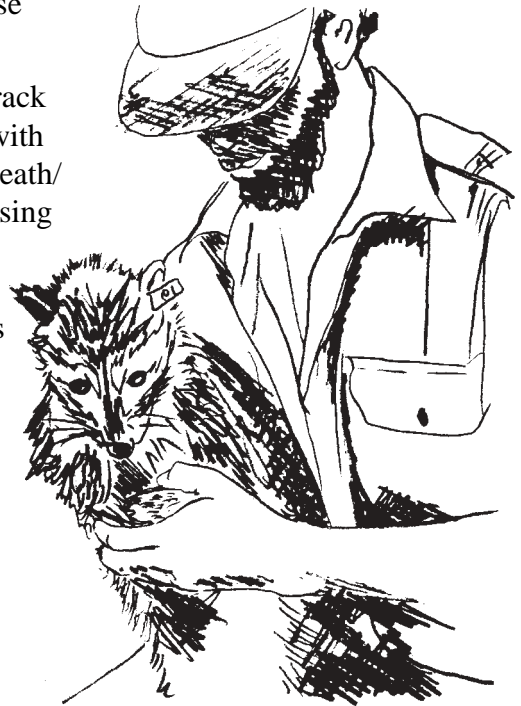
Research

Wildlife **research** involves scientific study of animal species. For example, the effects of habitat fragmentation and degradation on Neotropical migrant birds (e.g., hummingbirds, vireos, warblers) have been researched. These species require large, unbroken tracts of undisturbed forests in order to nest successfully. IDNR is looking at how Iowans can better manage forest tracts for these birds.

Endangered animals (e.g., barn owls, bald eagles, peregrine falcons) have been studied to determine their specific habitat needs and survivability in Iowa. Documentation and publication of research helps wildlife agencies manage these species in neighboring states.

Radio telemetry is an important tool biologists use to track movements of wild animals. Individual animals are fitted with radio transmitters so their movements can be monitored. Death/birth rates and migratory patterns also can be determined using telemetry. IDNR has used this method with a variety of animals ranging from songbirds and bats to raccoons and white-tailed deer. It was used on the river otter when it was reintroduced in the 1980s. Valuable data were gathered on otters' movements that helped biologists assess how large an area they require to live and their habitat preferences.

Research also includes monitoring demographics and opinions. Iowans' attitudes and opinions impact our wildlife management programs. Public opinion may affect laws passed by the Legislature, which in turn, may greatly impact Iowa's wildlife.



Wildlife Research Projects

Computer modeling helps biologists predict population numbers, age structures, and sex ratios of *white-tailed deer*. One management goal for these valued game animals may be to sustain populations near carrying capacity so there will always be deer to harvest. Another goal may be bucks with larger antlers for trophy seekers. IDNR manipulates season dates, allowable harvest numbers, and the sex harvested for deer in different parts of the state to accomplish different goals.

White-tailed deer numbers may be high where hunting is not allowed. Deer may over-browse habitat and turn to crops, shrubs, trees, and garden plants. They may be a nuisance, or even reduce the diversity of plant species in natural areas. Biologists are researching white-tailed deer movements and mortality factors in urban and park environments to resolve some of these difficult situations.

IDNR's main management goal for *ring-necked pheasants* is to increase their survival. Biologists use telemetry to monitor winter survival, movement of adult birds, and survival and movement of chicks. Data are used to create computer models to predict ring-necked pheasant movements, survivability, and population potentials in different habitats with different weather regimes.

Ring-necked pheasants require grasses for nesting and escape cover. They eat waste grain in fields. So, grasslands interspersed with agricultural fields provide ideal habitat. Private lands biologists work with landowners to use government cost-share programs to increase nesting and winter habitat on private lands.

IDNR biologists attempt to determine the survival and mortality factors of young *eastern wild turkeys* (poults) during their first few months of life. They use radio telemetry to monitor poults. Eastern wild turkeys once were extirpated from Iowa, but now are found in 98 percent of available habitat in the state. IDNR would like to acquire more suitable habitat and manage public forests to maintain eastern wild turkey populations at carrying capacity.

IDNR conducted a *bobwhite quail* study from 1984 to 1988. Adult birds were radio-tracked to determine their breeding strategies and nesting success. Biologists found that populations continue to decline even though the male often incubates the eggs while the female moves to another site and lays a second clutch.

Bobwhite quail populations declined due to changing agricultural and land-use practices. They thrive in brushy habitat created by young trees and shrubs. Early in the 1900s, Osage orange trees planted to create “living fencerows” provided excellent quail habitat. (Fences now are built with steel and wooden posts.) Adverse weather conditions also have affected quail survival in Iowa. Biologists work with landowners to use farm programs to establish shelterbelts and edge habitat surrounding fields to provide more quail habitat. They also monitor populations and adjust seasons and limits accordingly.

Regulations

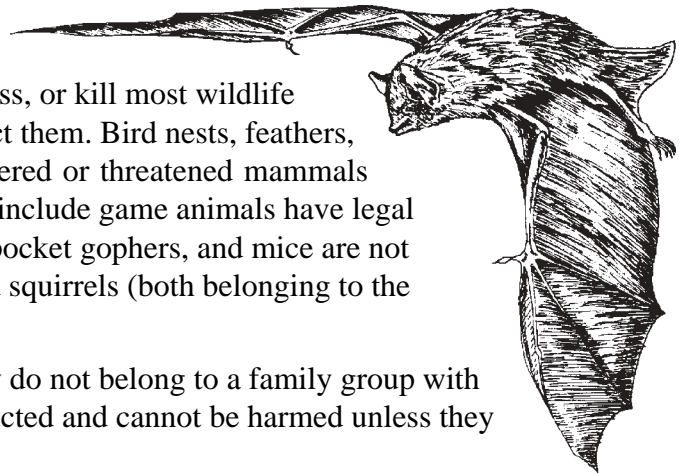
It is illegal to harm, harass, possess, or kill most wildlife species. Federal and state laws protect them. Bird nests, feathers, and eggs also are protected. Endangered or threatened mammals and those in taxonomic families that include game animals have legal protection. This means most moles, pocket gophers, and mice are not protected, but chipmunks and ground squirrels (both belonging to the squirrel family) are.

Bats are the only exception. They do not belong to a family group with game species, but ALL bats are protected and cannot be harmed unless they are in dwellings where people live.

European starlings, house sparrows, garter snakes, and insects that are not endangered or threatened are not protected. Timber rattlesnakes receive only limited protection under a recently passed law.

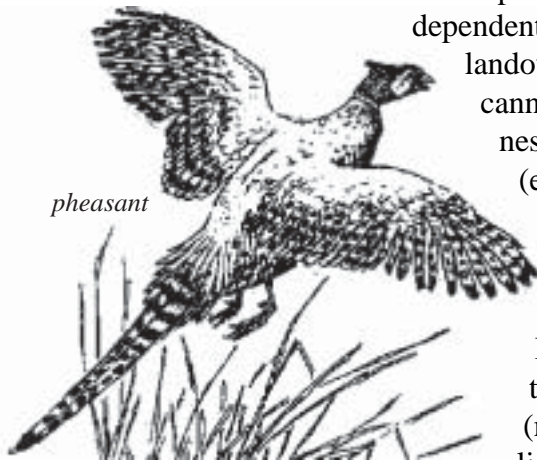
Game animals (e.g., ring-necked pheasants, ducks, raccoons, turkeys, white-tailed deer) can be harvested during certain times of the year. They are protected the rest of the year. Hunters must have a license (residents 16 years and older) and follow regulations set by the IDNR or the Iowa Legislature.

Hunting regulations help managers maintain wildlife populations. They: 1) control the number of each game species taken; 2) provide a more even distribution of game taken among hunters; 3) protect wildlife species that are more vulnerable to hunting pressure; and in some cases 4) protect or regulate the harvest of females to increase or decrease the potential number of young produced.



IDNR has the legal authority to set most hunting regulations to alter, control, or increase game species' populations. **Hunting seasons** (dates and time of day when it is legal to hunt), **bag limits** (number of animals that may be taken legally each day), and **possession limits** (number of animals an individual can possess at any one time) are based on knowledge of current and historic game populations and distributions. Biologists also consider social factors (e.g., human safety, ethics, economic impact of some species, tolerance of landowners for certain species of wildlife) when recommending hunting regulations.

Seasons are set so as not to disturb the reproduction of a species. Ring-necked pheasants and waterfowl are not hunted during the nesting season. Trappers usually are not allowed to trap furbearers (e.g., beavers) when they have dependent young. (The NRCS also sets mowing dates for landowners with property in federal programs; they cannot mow these areas during peak pheasant nesting dates.) Harvest may be limited to males (e.g., only rooster pheasants are harvested since one rooster mates with several hens).



Limits help distribute the harvest, and recreation opportunities, among more hunters. In many cases, the number of birds that can be taken is limited. Hunters can take only rooster (male) ring-necked pheasants and there is a daily limit of three birds per person.

Special youth seasons allow youngsters between the ages of 12 and 15 to hunt prior to regular seasons. Each youth must be accompanied by a licensed adult (who is not allowed to hunt) and have completed a Hunter Education course. This is an attempt to emphasize hunter ethics and safety and give young hunters a special opportunity. It has been very popular—Iowa is one of the national leaders in this program.

Habitat Enhancements

Many things can be done to increase wildlife populations. Landscaping, nest boxes, and reintroduction programs for some of Iowa's native species have been very beneficial for all of Iowa's wildlife.

Wood ducks and bluebirds are **cavity nesters**. They use holes in **snags** (standing dead trees) to nest. Nest boxes, which simulate cavities in trees, have helped increase their numbers. American kestrel boxes have been placed on interstate road signs.

Landscaping for wildlife is very popular. Hummingbirds and butterflies are attracted to gardens with nectar producing flowers. Trees provide food and shelter for wildlife while reducing heating and cooling bills. Small ponds, added to any backyard, provide water for birds, chipmunks, frogs, and toads. Bat houses in suitable areas attract these mosquito-eating animals.



People purchase land to enjoy outdoor activities such as camping, hunting, viewing wildlife, or prairie restoration. Current farm programs (traditionally oriented to saving soil) now include wildlife and habitat conservation/enhancement as important objectives. IDNR and private businesses have biologists who help landowners design management plans that help them reach their wildlife goals on their land. They also help locate funding assistance to implement these plans. See the *Resource Guide* for lists of IDNR biologists and conservation programs.

Future of Wildlife Management

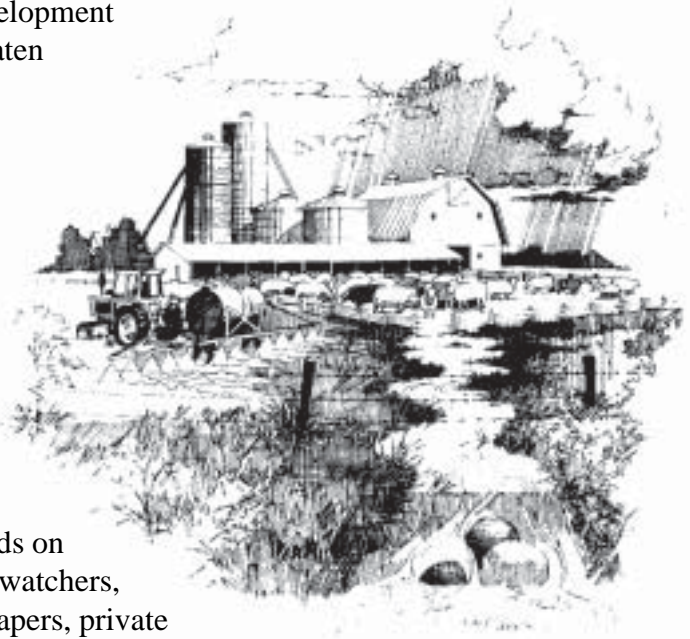
Wildlife management involves political, social, and biological factors. IDNR biologists must monitor wildlife through surveys and research to effectively manage all wildlife species. Citizens also play an important role in wildlife management by supporting conservation programs and legislation and creating wildlife habitat. Wildlife management has restored wildlife populations, including white-tailed deer, wild turkeys, otters, peregrine falcons, and more. Additional wildlife species will benefit from future management efforts.

Providing quality habitat areas, large enough to support specialized wildlife species, is a challenge facing wildlife managers. Urban sprawl, intensive agriculture, confinement livestock operations, and industrial development often decrease wildlife habitat and threaten water quality.

Non-profit groups (e.g., Nature Conservancy, Ducks Unlimited, Pheasants Forever, Iowa Natural Heritage Foundation, Trees Forever, and others) have emerged as leaders in conservation. These groups work cooperatively with government agencies to accomplish conservation goals. See the *Resource Guide* for more information.

The future of Iowa's wildlife depends on cooperative efforts by hunters, wildlife watchers, anglers, hikers, bikers, backyard landscapers, private landowners, legislators, and others. Management on private lands using conservation incentives provides the most promising future for Iowa's wildlife.

Traditionally, fees paid by hunters and anglers, either as excise taxes on related gear or in direct licenses fees, have funded habitat management, land acquisition, education, and research. Deer license sales in Iowa generate more than \$4 million annually. Since 1934, the federal duck stamp program has provided more than \$406 million for wetland restoration and acquisition. Stable, long-term support from a broader constituency is needed. Efforts to obtain federal funding for nongame wildlife, recreation, and education programs may provide such support.



Other Materials

- Bailey, J.A. 1984. Principles of Wildlife Management. New York: John Wiley and Sons, Inc.
- Cadieux, C.L. 1985. Wildlife Management on Your Own Land. Harrisburg, PA: Stackpole Books.
- Farris, A.L. et al. 1977. The Ring-necked Pheasant in Iowa. Des Moines: Iowa Conservation Commission.
- Hale, J.P. et al. 1986. Management of Nongame Wildlife in the Midwest: A Developing Art. North Central Section of the Wildlife Society.
- Henderson, C.L. 1987. Landscaping for Wildlife. St. Paul: Minnesota Department of Natural Resources.
- Hine, L. and S. Nehls. 1980. White-tailed Deer Population Management in the North Central States. North Central Section of the Wildlife Society.
- Iowa Association of Naturalists. 1995. Keeping Wildlife Wild. (available from: ISU Extension, www.extension.iastate.edu/pubs, 515/294-5247)
- Iowa Association of Naturalists. 1991. Managing Iowa Wildlife: Wild Turkeys. (available from: ISU Extension, www.extension.iastate.edu/pubs, 515/294-5247)
- Iowa Association of Naturalists. 1997. Managing Iowa Wildlife: White-tailed Deer. (available from: ISU Extension, www.extension.iastate.edu/pubs, 515/294-5247)
- Iowa Department of Natural Resources. Attracting Backyard Wildlife. Des Moines.
- Iowa Department of Natural Resources. 1994. Iowa Hunting and Trapping Regulations. Des Moines.
- Iowa Department of Natural Resources. 1992. Non Game Accomplishments 1982 to 1992: The First Decade. Des Moines.
- Iowa Department of Natural Resources. 1994. Trends in Wildlife Populations and Harvest. Des Moines.
- Leopold, A. 1933. Game Management. New York: Charles Scribner's Sons.
- Leopold, A. 1966. A Sand County Almanac. Oxford University Press.
- State of Iowa. 2001. Trends in Iowa Wildlife Populations and Harvest 2000. Des Moines: Iowa Department of Natural Resources.
- The Wildlife Society, Inc. 1980. Wildlife Management Techniques Manual. Bethesda, MD.
- Trefethen, J.B. 1975. An American Crusade for Wildlife. Alexandria, VA: Boone and Crockett Club.
- USDA and IDNR. 2001. Attracting Wildlife On Private Lands.

WILD Activities (grade level)

- Animal Poetry (5-8)*
- Back from the Brink (9-12)*
- Can Do! (9-12)*
- Carrying Capacity (9-12)
- Checks and Balances (5-8)*
- Classroom Carrying Capacity (K-4)
- Deer Crossing (9-12)
- Fire Ecologies (9-12)*
- From Bison to Bread: The American Prairie (9-12)*
- Here Today, Gone Tomorrow (5-8)*
- History of Wildlife Management (5-8)*
- How Many Bears (Coyotes) Can Live in This Forest? (5-8)*
- Hunter, The (5-8)*
- Muskox Maneuvers (5-8)
- Oh Deer! (5-8)*
- Pay to Play (5-8)*
- Quick Frozen Critters (5-8)
- Rare Bird Eggs For Sale (5-8)*
- Which Niche? (5-8)*
- Wildlife Issues: Community Attitude Survey (9-12)*

* Supplemental information provided for italicized activities.